BRITISH VIEW

MULTIDISCIPLINARY JOURNAL

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Editor Multidisciplinary Journals

British View ISSN 2041-3963 Volume 8 Issue 5 2023
Universal impact factor 8.528
SJIF 2022: 4.629

Language developing activities for students of science and technology.

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Abstract: This article discusses useful problem-solving activities which are aimed to develop students' language skills who are studying to get their degrees in science and technology. It presents the activities which will develop their reading, writing, listening and speaking skills. The article also discusses the usefulness of making presentations, taking colleagues on tours of facilities or laboratories, writing reports, participating in technical meetings, mentoring peers.

Keywords: Accomplish, dedication, qualified, unquestionably, inventiveness, humanistic, necessitating, proper

The educational landscape is changing significantly. In several areas of social and economic life, our nation requires qualified professionals. As a result of these changes, we feel a significant duty to train the experts who will help our nation thrive. Because of this, teachers need to be knowledgeable about teaching ESP. We concur with various authors in believing that instructing English to kids studying science and technology can be equally career-focused, personally fulfilling for the pupils, and enjoyable for the teacher. Designing materials to accomplish these goals is made easier by the concept of macro-tasks. Marco-tasks are pedagogical and language activities that simulate actual socio-professional interactions and are created to help students develop the skills needed for their chosen professions and to enhance English proficiency. A language teacher can easily understand Marshall's explanation of the engineering field: "A professional engineer is not only someone with a given amount and sort of information. To be a true professional, an engineer needs to possess a variety of other traits, including self-drive, dedication to one's work, adaptability and ingenuity in problem-solving, and interpersonal and communication abilities. There are a wide variety of macro-activities that scientists and technicians can engage in, but it is simple to list the ones that most frequently call for the use of English as a foreign language: reading publications, writing reports and publications, attending conferences, giving presentations, speaking on the phone, writing letters, participating in technical meetings, showing coworkers around a plant, socializing, and traveling. Since problem-solving activities closely resemble technical meetings, they can be thought of as such macro-tasks. In order to help students learn and practice the language of their trade, an English course aimed at assisting them should unquestionably include such exercises. Science and technology are by their very nature involved with solving issues. In actuality, problem-solving is a mental exercise that blends inventiveness with specialized knowledge. As a result, it plays a significant role in a humanistic method of teaching languages. The students will attempt to apply their technical knowledge, necessitating the use of the proper language, whether it be specific terminology, concepts, or functions of scientific discourse. This can also be closely related to specialty disciplines. A problem-solving session is also a communication exercise since participants must exchange ideas, justify their answers, discuss the viability of their inventions, assess competing ideas,

and speculate on how the project they have chosen might be implemented. Then, language and discourse will be used as tools for social and intellectual tasks. It is evident that prior preparation or the acquisition of the required language components are required before beginning this type of macro-task.

The teacher needs to make sure that the pupils are comfortable with mini-tasks like how to describe a setup, how to comment on visuals, how to instruct, how to propose, how to explain, how to evaluate, how to criticize, how to define, how to classify, how to agree or disagree, etc. It also helps to have a rudimentary understanding of technical and scientific terms. This is the reason that only intermediate and advanced levels can introduce this type of macro-task. Simpler tasks, such as asking students to present various pictures or mini-texts and stressing the communication parts of the information exchange, can be used to practice basic terminology, conceptions, and functions beforehand. Since solving problems affects almost every minute of one's life, the topics can be about anything and don't necessarily need to be high-tech. We will eliminate topics that are more psychological, social, or cultural in order to produce a list of topics that are more in line with the interests and demands of science and technology students. Although we don't mean to imply that students of science and technology wouldn't enjoy them, those topics are more easily accessible in a variety of already published manuals. Activities that are particularly useful linguistically include asking students to come up with answers to the personal issues revealed in "Dear Helen" letters or to come up with interpretations of pieces of art. [Hutchinson 1987, 97-99p.]

However, the goal of this lesson is to prepare students for more technical meetings that also require consideration of the personal, social, and environmental context. According to Marshall, a really competent engineer must be able to describe the problem and take into account not only the technical aspects but also any relevant social, cultural, and environmental factors. It is obvious that language will be used as a tool in the process of finding a solution to the issue. This kind of activity uses a wide range of languages. Definition, breakdown of components and processes, presentation of a procedure, clarification requests, breakdown of visuals, instructions, discussion, expression of viewpoints, etc. When leading a problem-solving session, the best course of action for maximizing effectiveness and language use is as follows:

First, the issue is expressed in one of the problem-posing typology's listed forms. After then, it is examined in order to provide explanation. The issue will need to be created for a cartoon or comic strip. It will need to be reformulated in the case of a recording. In certain cases, the issues won't be stated outright; instead, they'll need to be revealed through an analysis of the circumstances. A brainstorming session and subsequent discussion can be helpful for this. In actual engineering scenarios, the issues are rarely stated in an obvious manner. Most of the time, the engineer will have to locate the issue after doing a thorough analysis of the circumstances and potential causes. A company's production department must look into any potential causes, such as air bubbles, rough or dirty surfaces, loose seals, the unsatisfactory quality or temperature of the injected plastic, etc., if a customer complains about the poor quality of an object produced by injection moulding. The

actual problem-solving session can then begin, ideally again in the style of brainstorming. The teacher should tell the pupil that at this point, there should be no criticism. The only way the group's other participants may speak up is to clarify anything. The teacher can stand in front of the class and sketch the solutions in accordance with the suggestions made by the students. Any solution, even the most absurd, is acceptable. By using analogies, combinations, or modifications, a crazy solution can open up new possibilities and finally lead to a more workable one. Numerous solutions ought to be supported. Never settle with just two or three, unless it's a high-tech or theoretical one. It is a good idea to have all the solutions written or drawn in plain sight of everyone, either on the board or on different sheets of paper that might be put or pinned on the walls, in order to promote creativity. The instructor may opt to break the class into smaller groups so that each group can come up with the answer or solutions they like instead of having a brainstorming session. Less language control is exerted on the part of the teacher, but if the students abided by the game's rules—speaking English to one another—more language would be used. Since each group will compete to find more solutions than the others, a component of completion can then be added. Evaluation can only take place after every possible solution has been investigated. To determine the top two or three possibilities, all students may be asked to weigh in on the various proposals. It's important to promote conversation. If they feel compelled to do so, authors should also try to defend their work. At that point, values may need to be included in some circumstances since the decision's financial and social repercussions may occasionally take precedence over its technological viability. The ideal solution should be straightforward, effective, affordable, in line with human nature, and a clear improvement over the predicament. The third step involves discussing various implementation or construction methods, including which materials and tools would be required, which method would be chosen, and how the operators would be scheduled and paid. The following questions can be used as a project management exercise during this session: who will be working on it, what tools and materials will be required, where will it be produced, how will it be scheduled, and how will it be financed.[Souillard 1989, p.24-27]

It goes without saying that conducting this activity with a class is incredibly thrilling and stimulating. English becomes a vehicle for expressing unique and individual thoughts and works. If the problem is open-ended, there are many different solutions that can be discovered or developed, allowing for both individual freedom and class interaction. The instructor is merely serving as a coordinator and facilitator; he or she need not be concerned with timing because if an issue is swiftly solved or does not particularly appeal to a group, he or she can move on to another one right away. In any case, a truly engaging class is remembered by both students and teachers. Larger macrotasks like role-playing simulations of technical meetings might also contain problem-solving activities. These simulations should be purchased ready-made because they take more effort to construct. The students participate in challenging but highly interesting and realistic problem-solving and decision-taking exercises through adventure or industrial situations, which call for intensive language

use. Some simulations even incorporate a game or element of chance, which makes them more thrilling and realistic. It is feasible to go one step further and set up quality circles if the students are accustomed to the practice of problem-solving. In this instance, the instructor does not present a set of issues to be resolved or instances to be studied. The group looks closely at one area of their lives and compiles a list of issues for discussion. The issues will then arise from the group's collective knowledge in areas such as how comfortable they feel in the residence hall, how safe they feel in the labs, how busy they are at work, or which particular science or technology project they are working on. The identical steps outlined above should be taken, with the exception that the issue will originate within the group rather than being brought in from outside. Before considering their implementation, the issues must first be identified, listed, and arranged, their root causes must be established, and then the remedies must be discovered and evaluated. [Souillard 1987, 29-31] For the most part, business and commercial English students, macro activities of this kind that are connected to the students' future professional situations and are cognitively and linguistically stimulating have produced extremely suitable material. But science and technology students have a real need for similar pertinent content. The numerous typologies depicted above should assist each instructor in finding or developing materials that can be used with students based on their academic standing and area of expertise.

The creations made in English for science and technology in the form of macro-tasks should not only focus on problem-solving or brainstorming, but also explore other professional activities like making presentations, taking colleagues on tours of facilities or laboratories, writing reports, participating in technical meetings, mentoring peers, etc. Now it's the instructor's chance to use their own imagination.

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